CONVEYORS

17.A GENERAL

17.A.01 Conveyor systems shall be constructed and installed in accordance with the manufacturer's recommendations.

17.A.02 Inspection, maintenance, and repair.

a. Inspection, maintenance, and repairs shall be performed in accordance with the manufacturer's recommendations by qualified personnel.

b. No maintenance shall be performed when a conveyor is in operation except for the following:

(1) if lubrication is to be done while the conveyor is in motion, lubrication points shall be easily accessible and safe for lubrication: only trained personnel who are aware of the hazards of the conveyor in motion shall be allowed to lubricate a conveyor that is operating; and

(2) when adjustments or maintenance is required while the conveyor is in operation, only trained personnel who are aware of the hazards shall be permitted to make the adjustment or maintenance.

c. Lockout and tagout procedures shall be used. ***> See Section 12***

d. Safe access shall be provided to permit inspection, lubrication, repair, and maintenance activities.

17.A.03 Safety devices.

a. On all conveyors where reversing or runaway are potential hazards or the effects of gravity create a potential for hazardous uncontrolled lowering, antirunaway devices, brakes, backstops, or other safeguards shall be installed to protect persons from injury and property from damage.

b. Conveyor systems shall be equipped with an audible warning signal to be sounded immediately before starting of the conveyor. ***> On overland conveyors systems, the devices shall be required only at the transfer, loading, and discharge points and those points where personnel are normally stationed***

c. All conveyors shall be equipped with emergency stopping devices along their full length.

d. Safety devices shall be arranged to operate in such a manner that if power failure or a failure of the device occurs a hazardous condition would not result.

17.A.04 All exposed moving machinery parts that present a hazard shall be mechanically or electrically guarded or guarded by location.

a. Nip and shear points shall be guarded.

b. Take-up mechanisms may be guarded as an entity by placing standard railings or fencing, and warning signs, around the area in lieu of guarding each of nip and shear point.

c. In the case of a trolley conveyor when mechanical or electrical guarding would render the conveyor unusable, prominent and legible warnings shall be posted in the area or on the equipment and, where feasible, areas barricaded or lines marked on the ground to indicate the hazard area.

d. Guards shall be provided at points where personnel could Contact cables, chains, belts, and runaways of exposed bucket conveyors.

e. Unless guarded by location, those sections of chain conveyors which cannot be enclosed without impairing the function shall be provided with warning signs or personnel barriers.

f. Trolley conveyors shall be provided with spill guards, pan guards, or the equivalent if there is a potential for material to fall off the conveyor and endanger personnel or equipment.

g. At transfer, loading, and discharge points, unconfined and uncontrolled free fall of material that may result from flooding, ricocheting, overloading, trajectory, leakage, or a combination thereof, shall be prevented if the material would create a hazard to personnel. ***> In the absence of a guard specifically erected to protect personnel, warnings shall be provided to restrict unauthorized personnel from entering such hazardous areas***

h. At all points along the conveyor, except at points where loads are removed from or placed on a conveyor or where a conveyor discharges to or receives material from another conveyor, provisions shall be made to eliminate the possibility of loads or material being dislodged from the conveyor.

17.A.05 Access.

a. Crossovers or underpasses with safeguards shall be provided for passage over or under all conveyors: crossing over or under conveyors is prohibited except where safe passageways are provided.

b. Whenever conveyors pass adjacent to, or over, work areas, roadways, highways, railroads, or other public passageways, protective guards shall be installed: the guards shall be designed to catch and hold any load or material that may fall off or become dislodged from the system.

c. Where conveyors are operated in tunnels, pits, and similar enclosures, ample room shall be provided to allow safe accessway and operating space for all personnel.

17.A.06 Emergency stop devices.

a. Unless the design, construction, and operation of a conveyor is clearly non-hazardous to personnel, emergency stop buttons, pull cords, limit switches, or similar emergency devices shall be provided at the following locations for remotely or automatically controlled conveyors or conveyors where operator stations are not manned of are beyond voice and visual contact from drive areas:

(1) loading arms,
(2) transfer points, and
(3) other potentially hazardous locations on the conveyor path not guarded by location or guards.

b. All emergency stop devices shall be easily identifiable and readily accessible.

c. Emergency stop devices shall act directly on the control of the conveyor concerned and shall not depend on the stopping of any other equipment.

d. Emergency stop devices shall be installed so that they cannot be overridden from other locations.

17.A.07 Gates and switches.

a. Power-positioned gate and switch sections shall be provided with devices which will prevent these sections from falling in case of power failure.

b. Means shall be provided on all gates and switch sections to prevent conveyed material from discharging into the open area created by lifting of the gate or switch.

17.A.08 Counterweights.

a. When counterweights are supported by belts, cables, chains, or similar means, the weights shall be confined in an enclosure to prevent the presence of personnel beneath the counterweight, or the arrangement shall provide a means to restrain the falling weight in case of failure of the normal counterweight support.

b. When counterweights are attached to lever arms they shall be securely fastened.

17.A.09 When two or more conveying systems are interfaced, special attention shall be given to the interfaced area to ensure the presence of adequate guarding and safety devices.

17.A.10 Conveyor controls shall be arranged so that in case of an emergency stop, manual reset or restart is required at the location where the emergency stop was initiated to resume conveyor operations.

17.A.11 Control stations shall be arranged and located so that the operation of the equipment is visible from them.

17.A.12 Controls shall be clearly marked or labeled to indicate the function controlled.

17.A.13 Hoppers and chutes.

a. All openings to the hopper and chutes shall be guarded to prevent persons from accidently stepping into them: if guards are not practical, warning shall be posted.

b. Dump hoppers having the hopper flush with the floor and which by their use cannot be guarded shall be equipped with grating having a maximum opening of 5 cm (2 in) and heavy enough to withstand any load which may be imposed on it. If the openings in the grating are larger or if no grating is provided, temporary railing shall be placed around ground level hoppers when dumping operation are not in progress: during dumping operation, warning signs shall be placed in conspicuous locations warning personnel of an open pit.

17.A.14 Mobile conveyors.

a. Mobile conveyors shall be provided with brakes or other position locking devices for each degree of motion where movement would present a hazard.

b. Mobile conveyors shall be designed to be stationary against runaway and stable against overturning under normal conditions of operation.

c. When an operator is required on a mobile conveyor, a platform or cab shall be provided for his/her protection.

17.A.15 Portable conveyors.

a. The raising and lowering mechanism for the boom of a portable conveyor shall be provided with a safety device which will hold boom at any rated angle of inclination.

b. Portable conveyors shall be stable so that the conveyor will not topple when used with the manufacturer's rating and in a manner in which it was intended or when being moved.

17.A.16 Screw Conveyors.

a. Screw conveyors shall not be operated unless the conveyor housing completely encloses the conveyor moving elements and power transmission guards are in place, except that if the conveyor must have an open housing as a condition of use, the entire conveyor shall then be guarded by railing, fence, or by location.

b. Feed openings for shovel, front-end loader, or other manual or mechanical equipment shall be constructed in such a way that the conveyor screw is covered by grating: if the nature of the material is such that grating cannot be used, then the exposed section of the conveyor shall be guarded by a railing and warning signs shall be posted.

17.B OPERATION

17.B.01 Conveyor equipment shall be used to convey only those materials for which it was designed and within the rated capacities and speeds.

17.B.02 Flight and apron conveyors shall be "jogged" or hand run through at least one complete revolution at installation to check design clearances prior to running under automatic power.

17.B.03 A conveyor that could cause injury when started shall not be started until all personnel in the area are alerted by a signal or by a designated person that the conveyor is about to start.

17.A.04 When a conveyor that could cause injury when started is automatically controlled or must be controlled from a remote location, an audible warning device shall be provided. The device shall be clearly audible at all points along the conveyor where personnel may be present.

a. The warning device shall be activated by the controller device that starts the conveyor and shall continue for a period of time before the conveyor starts; a flashing light or similar visual warning shall be used with the audible device when conditions limit the effectiveness of the audible device.

b. If a conveyor system is not exposed to the public, and if function of the system would be seriously hindered or adversely affected by the required time delay or where the intent of the warning may be misinterpreted, clear, concise, and legible warning signs shall be provided and indicate that the system may be started at any time, that danger exists, and that personnel must keep clear: these warnings signs shall be provided along the conveyor at areas which are not guarded or protected by their location.

17.B.05 Before restarting a conveyor that has been stopped because of an emergency, an inspection of the conveyor shall be conducted and the cause of the emergency stop determined.

17.B.06 Only trained personnel shall be permitted to operate a conveyor: training shall include instruction in operation under normal conditions and in emergencies.

17.B.07 The area around loading and unloading points shall be kept clear of obstructions that could create a hazard.

17.B.08 Riding on conveyors is prohibited.

17.B.09 Personnel working with or near a conveyor shall be:

a. instructed as to the location and operation of pertinent stopping devices, and

b. alerted of the potential hazard of entanglement in conveyors caused by such items as loose clothing and jewelry and long hair.

17.B.10 Only trained personnel shall track a conveyor belt which must be done while the conveyor is operating.

17.B.11 Applying a belt dressing or other foreign material to a rotating drive pulley or conveyor belt shall be avoided.

17.B.12 Flight and apron conveyors handling sticky materials which tend to build up shall be cleaned as often as required for safe operation.

DEFINITIONS

Antirunaway: a safety device to stop a declining conveyor in case of mechanical or electrical failure.

Apron conveyor: a conveyor in which a series of apron pans forms a moving bed.

Apron pans: one of a series of overlapping or interlocking plates or shapes that, together with others, form the conveyor bed.

Backstop: a device to prevent reversal of a loaded conveyor under action of gravity when forward travel is interrupted.

Bucket conveyor: any type of conveyor in which the material is carried in a series of buckets.

Chain conveyor: any type of conveyor in which one or more chains act as the conveying medium.

Conveyor: a horizontal, inclined, or vertical device for transporting material in a path predetermined by the design of the device and having points of loading and discharge.

Flight conveyor: a type of conveyor consisting of one or more endless propelling media, such as chain, to which flights are attached, and a trough through which material is pushed by the flights.

Gate: a device or structure by means of which the flow of material may be stopped or regulated.

Guarded by location: describes moving parts so protected by their remoteness from the floor, platform, walkway, or other working level, or by their location with reference to frame, foundation, or structure as to reduce the foreseeable risk of accidental contact by persons or objects. Remoteness from foreseeable, regular, or frequent presence of public or employed personnel may in reasonable circumstances constitute guarding by location.

Hopper: a box having a funnel-shaped bottom, or a bottom reduced in size, narrowed, or necked to receive material and direct it to a conveyor, feeder, or chute.

Mobile conveyor: a conveyor supported on a structure which is movable under its own power.

Overland conveyor: a single or series of belt conveyors designed to carry material across a distance, usually following the general contour of the load.

Portable conveyor: a transportable conveyor which is not self-propelled, usually having supports which provide mobility.

Screw conveyor: a conveyor screw revolving in a suitably shaped stationary trough or casing fitted with hangers, trough ends, and other auxiliary accessories.

Switch: a device for connecting two or more continuous package conveyor lines; an electrical control device; or a mechanism that transfers a trolley, carrier, or truck from one track to another at a converging or diverging section.

Take-up: the assembly of the necessary structural and mechanical parts that provides the means to adjust the length of belts, cables, chains, and similar transmission mechanisms to compensate for stretch, shrinkage, or wear, and to maintain proper tension.

Trolley conveyor: a series of trolleys supported from or within an overhead truck and connected by endless propelling means, such as chain, cable, or other linkage, with loads usually suspended from the trolleys.